



## **NASA STTR 2010 Phase I Solicitation**

### **T6.01 Inflatable Modules**

**Lead Center: JSC**

This subtopic solicits innovative structural concepts that support the development of lightweight structures technologies that could be applicable to space applications. The targeted innovative lightweight structures are for primary pressurized volumes. Innovations in technology are needed to minimize launch mass, size and costs, while increasing operational volume and maintaining the required structural performance for loads and environments.

Of particular interest are inflatable structures, which are viable solutions for increasing the volume in habitats, airlocks, and potentially other crewed vessels. To build confidence in the use of these structures; design, analysis and manufacturing methods that produce optimal structure on a consistent basis need development above the current state of the art.

The development, analysis, and testing of dual purpose materials that show significant benefits in more than one area such as structural, thermal protection, micrometeoroid/ orbital debris protection, radiation protection, atomic oxygen protection, and such are of particular interest.

The folding, packaging and deployment of multi-layer systems especially those with an integrated window or hatch penetration and particularly those of a torus shape surrounding a cylindrical body are also an area of interest.

Also of interest are low permeable bladder materials and the development and testing of a low permeable interface between a gas barrier and a structural core or hatch penetration that is durable over time and does not degrade due to effects such as cold flow. Development of low permeability bladder materials that can tolerate flexure at cold temperatures are of particular interest.

Developments can include material development and testing, conceptual design and demonstration, analysis methods and verification, and/or manufacturing techniques. Technological improvements focus on risk reduction/mitigation, and development of reliable yet robust designs under this announcement. Research demonstrates the technical feasibility during Phase I and shows a path toward a Phase II hardware demonstration, and when possible, delivers a demonstration unit for functional and environmental testing at the completion of the Phase II contract.

